

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Shinichi HAYAKAWA et al.

Serial No. 09/890,863

Filed: August 7, 2001

For: WOVEN FABRIC FOR LOUD-
SPEAKER DIAPHRAGM,
DIAPHRAGM FOR LOUD-SPEAKER
AND LOUD-SPEAKER

) Group Art Unit: 1771

) Examiner: J. Befumo

CERTIFICATE OF MAILING

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SUPPLEMENTAL APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 35 U.S.C. § 134 and 37 C.F.R. §§ 1.192(a) and 1.193(b)(2)(ii), Appellants request reinstatement of the appeal and submit this Supplemental Appeal Brief in response to the examiner's rejection of claims 19-24 in the Official Action mailed May 20, 2005.

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I. REAL PARTY IN INTEREST

The named inventors have assigned all ownership rights in the pending application to Kabushiki Kaisha Kenwood, 14-6, Dougenzaka 1-chome, Shibuya-ku, Tokyo 150-0043, Japan, which is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

The appellants, their legal representatives, and the assignee are not aware of any other prior or pending appeals, interferences or judicial proceedings which will directly affect or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 19-24 are pending in the present application, of which claims 19, 23 and 24 are independent. Claims 1-18 were canceled and claims 19-24 stand rejected. No claims have been deemed allowable by the examiner.

IV. STATUS OF AMENDMENTS

The Appellants filed an *Amendment After Final* on July 23, 2004, but the *Amendment After Final* was not entered by the Examiner for reasons stated in an *Advisory Action* mailed August 19, 2004. In response to the *Advisory Action*, the Appellants filed a *Notice of Appeal* regarding the rejection of claims 19-24. The claims that are the subject of the present Appeal are as set forth in the *Amendment* filed July 10, 2003. The Appellants do not wish to have the *Amendment After Final* entered. Thus, the status of the claims in this application is as set forth above, and in Appendix A. All prior amendments are believed to have been entered in the present application.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is directed to a loud-speaker (e.g. Figure 6, loud-speaker 3) comprising a diaphragm (e.g. diaphragm 4), a portion of the diaphragm comprising a woven fabric woven with a thread (e.g. Figures 1 to 5) comprising fibers of plural kinds, characterized in that at least one of said fibers of the plural kinds is a fiber with poor dye-affinity such as PBO (poly(p-phenylene benzobisoxazole)) fiber (e.g. PBO fiber 1) and at

least another one of said fibers of the plural kinds is a fiber colored with dyes or pigments (e.g. polyester fiber 2). Also, the present invention is directed to a diaphragm for a loud-speaker comprising a woven fabric woven with the thread described above. Further, the present invention is directed to a woven fabric for loud-speaker diaphragm using a woven fabric woven with the thread described above.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The claims shall not stand or fall together, but shall be separately argued as follows:

- A. Whether claims 21-24 are indefinite under 35 U.S.C. § 112, second paragraph.
- B. Whether claims 19-24 are anticipated under 35 U.S.C. § 102 by U.S. Patent No. 5,233,821 to Weber, Jr. et al.
 - 1. Whether claims 22 and 24 are anticipated by Weber.
 - 2. Whether claims 21 and 23 are anticipated by Weber.
 - 3. Whether claims 19 and 20 are anticipated by Weber.
- C. Whether claims 21-24 are obvious under 35 U.S.C. § 103 based on the combination of Weber and RD 354039.

VII. ARGUMENTS

- A. Whether claims 21-24 are indefinite.

Paragraph 4 of the Official Action rejects claims 21-24 under 35 U.S.C. § 112, second paragraph, asserting that claims 21 is indefinite “since it is unclear what portion of the diaphragm is made up by the woven fabric and what the additional structure limitations of the diaphragm is claimed” and “the applicant does not recite any other additional structural limitations of the diaphragm” (page 2, Paper No. 0505). Similarly, the Official Action asserts that claims 22 and 24 are indefinite “since it is unclear what the structure of the loud speaker and the loud speaker diaphragm are” (page 6, Id.). The Appellants respectfully disagree and traverse the above-referenced assertions in the Official Action.

The arguments in the Official Action appear to be directed to the breadth of the claims, not the clarity of the claims. That is, the Official Action appears to assert that the claims do not provide a sufficient recitation of the diaphragm of the speaker. The Appellants respectfully submit that such rejection is improper since the claims are not required to include well known elements and should focus on the point of novelty of the invention. Furthermore, the claims already define the metes and bounds of the invention and, when read in light of the specification, clearly define the invention.

The Applicants respectfully submit that claims 21-24, when read in light of the specification, are adequately described in the specification and definite. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 112 are in order and respectfully requested.

B. Whether claims 19-24 are anticipated by U.S. Patent No. 5,233,821 to Weber, Jr. et al.

Paragraph 8 of the Official Action rejects claims 19-24 as being anticipated by U.S. Patent No. 5,233,821 to Weber, Jr. et al. The Appellants respectfully traverse the rejection because the Official Action has not established an anticipation rejection.

As stated in MPEP § 2131, to establish an anticipation rejection, each and every element as set forth in the claim must be described either expressly or inherently in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Appellants respectfully submit that an anticipation rejection cannot be maintained against the independent claims of the present invention. Weber does not teach all the elements of the independent claims, either explicitly or inherently. Specifically, Weber does not teach a loud-speaker comprising a diaphragm, a diaphragm for a loud-speaker, or a woven fabric for a loud-speaker diaphragm, either explicitly or inherently.

Weber is directed to providing a fabric for a garment which is "useful for protection against fire and/or cutting" (column 1, lines 6-8). More specifically, Weber appears to describe synthesizing a fiber such as PBO having a desired tensile strength, forming a composite thread of a plurality of fibers containing the synthesized fiber, wrapping the

composite thread with a wrap fiber and weaving the wrapped composite threads into the fabric by a prior art method. As noted in detail below, Weber is completely silent as to a loud-speaker, a loud-speaker diaphragm or a woven fabric for a loud-speaker diaphragm, and Weber does not inherently teach such features.

1. Whether claims 22 and 24 are anticipated by Weber.

Dependent claim 22 positively recites a loud-speaker comprising a loud-speaker diaphragm. Specifically, claim 22 recites a loud-speaker comprising a loud-speaker diaphragm, characterized in that the loud-speaker diaphragm is made up of the woven fabric for a loud-speaker diaphragm according to claims 19 or 20. Independent claim 24 recites a loud-speaker comprising a diaphragm. With respect to claims 22 and 24, the Official Action asserts that “the limitation that the woven fabric is used in a loud-speaker is viewed as intended use since the claims fail to positively recite the structure of the loud-speaker other than the woven fabric itself” (page 3, Paper No. 0304). The Appellants respectfully disagree and traverse the above assertions.

Initially, it is noted that claims 22 and 24 do not recite that “the woven fabric is used in a loud-speaker.” This is a mischaracterization of the claims. Rather, a loud-speaker and a loud-speaker diaphragm are positively recited in the claims as described in detail above. These features are also described in the specification, for example at paragraph [0034], and in the drawings at Figures 6(A) and 6(B). The descriptions in the present specification and in Figures 6(A) and 6(B) indicate that a loud-speaker is a sound producing device. Specifically, an example of a loud-speaker is shown in Figures 6(A) and 6(B) and is marked with reference number 3. The specification notes the following: “the above described woven fabric is used on the surface of the diaphragm 4 of the loud-speaker [3] ... The diaphragm 4 for the loud-speaker using the above described woven fabric for the loud-speaker diaphragm is installed in the main body of the loud-speaker 3” (page 13, paragraphs [0034] – [0035]). The loud-speaker recited in claims 22 and 24 is not merely an intended use, rather it is a positively recited element of the claim and cannot be dismissed. The same is true of the diaphragm recited in claims 22 and 24. The Appellants simply cannot understand how the Official Action comes to the conclusion

that the positively recited limitations of a loud-speaker and a loud-speaker diaphragm can be viewed as intended use.

The Official Action has presented Weber, which appears to teach a fabric for a garment which is "useful for protection against fire and/or cutting." In other words, Weber teaches a glove comprising a fabric with a PBO thread, etc. Weber has absolutely nothing to do with loud-speakers, either explicitly or inherently. Therefore, Weber does not teach a loud-speaker, either explicitly or inherently.

2. Whether claims 21 and 23 are anticipated by Weber.

Dependent claim 21 positively recites a diaphragm for a loud-speaker. Specifically, claim 21 recites a diaphragm for a loud-speaker, characterized in that the woven fabric for a loud-speaker diaphragm according to claims 19 or 20 is used in at least a portion of the diaphragm. Independent claim 23 recites a diaphragm for a loud-speaker. With respect to claims 21 and 23, the Official Action asserts that "claims 21 and 23 which recite 'a diaphragm for a loud speaker' in the preamble is interpreted as intended use since the Applicant fails to recite any further structural limitations to the woven fabric" (page 4, Paper No. 0304). The Appellants respectfully disagree and traverse the above assertions.

A diaphragm for a loud-speaker is positively recited in claims 21 and 23 as described in detail above. The descriptions in the present specification and in Figures 6(A) and 6(B) indicate that a diaphragm is that portion of a loud-speaker which vibrates to produce sound waves. Specifically, an example of a diaphragm is shown in Figures 6(A) and 6(B) and is marked with reference number 4. As noted above, the specification describes the following: "the above described woven fabric is used on the surface of the diaphragm 4 of the loud-speaker [3] ... The diaphragm 4 for the loud-speaker using the above described woven fabric for the loud-speaker diaphragm is installed in the main body of the loud-speaker 3" (page 13, paragraphs [0034] – [0035]). The diaphragm recited in claims 21 and 23 is not merely an intended use, rather it is a positively recited feature of the claim and cannot be dismissed.

As noted above, the Official Action has presented Weber, which teaches, for example, a glove comprising a fabric with a PBO thread. In addition to having nothing to

do with loud-speakers, Weber has absolutely nothing to do with diaphragms for loud-speakers, either explicitly or inherently. Therefore, Weber does not teach a diaphragm, either explicitly or inherently.

3. Whether claims 19 and 20 are anticipated by Weber.

Independent claim 19 recites "a woven fabric for loud-speaker diaphragm." The Official Action asserts that the "loud speaker diaphragm is not positively recited, and is considered intended use, and the prior art should only be capable of performing the intended use, which in this case is true" (page 4, Paper No. 0304). The Applicants respectfully disagree and traverse the above-referenced assertions.

MPEP § 2111.02, under the heading "PREAMBLE STATEMENTS LIMITING STRUCTURE" notes the following:

Any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation. ... In re Stencel, 828 F.2d 751, 4 USPQ2d 1071 (Fed. Cir. 1987). (The claim at issue was directed to a driver for setting a joint of a threaded collar, however the body of the claim did not directly include the structure of the collar as part of the claimed article. The examiner did not consider the preamble, which did set forth the structure of the collar, as limiting the claim. The court found that the collar structure could not be ignored. While the claim was not directly limited to the collar, the collar structure recited in the preamble did limit the structure of the driver. "[T]he framework - the teachings of the prior art - against which patentability is measured is not all drivers broadly, but drivers suitable for use in combination with this collar, for the claims are so limited." *Id.* at 1073, 828 F.2d at 754.).

MPEP § 2111.02, under the heading "PREAMBLE STATEMENTS RECITING PURPOSE OR INTENDED USE" notes the following:

The claim preamble must be read in the context of the entire claim. The determination of whether preamble recitations are structural limitations or mere statements of purpose or use "can be resolved only on review of the entirety of the [record] to gain an understanding of what the inventors actually invented and intended to encompass by the claim. ...

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference ... between the claimed invention and the prior art. If so, the recitation serves to limit the claim.

A review of the entirety of the record indicates that the inventors actually invented and intended to encompass a woven fabric for a loud-speaker diaphragm. The specification is clearly directed to a woven fabric for a loud-speaker diaphragm as recited in the abstract, and in paragraphs [0001], [0009], [0013], [0015], [0016], [0019] – [0023], [0027], [0032], [0035] – [0037], [0039] – [0041] and [0043]. The Appellants respectfully submit that the teachings of the prior art against which patentability is measured should not be all woven fabrics broadly, but woven fabrics suitable for use in combination with a loud-speaker or a loud-speaker diaphragm. As a practical matter, a woven fabric for a loud-speaker diaphragm at least has a different shape from, for example, the glove of Weber. As such, the recitation of “a woven fabric for loud-speaker diaphragm” serves to limit the claim and should be interpreted accordingly. For the reasons stated in detail above, Weber does not teach a loud-speaker diaphragm, either explicitly or inherently.

Since Weber does not teach all the elements of the independent claims, either explicitly or inherently, an anticipation rejection cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 are in order and respectfully requested.

C. Whether claims 21-24 are obvious based on the combination of Weber and RD 354039.

Paragraph 10 of the Official Action rejects claims 21-24 as obvious based on the combination of RD 354039 and Weber. The Applicants respectfully traverse the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the

references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify RD '039 and Weber or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be used together, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references "could have been" combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

RD '039 appears to teach that "[f]ibre of ... (PBO) can be used in ... in speaker cones" (pages 1-2). RD '039 is concerned with the use of PBO for its high tensile strength and modulus, high inflammability and heat resistance, and low smoke generation and moisture sensitivity. The Official Action concedes that RD '039 does not teach "how the fiber is made into a fabric" (page 4, Paper No. 0505). In addition to the concession in the Official Action, the Appellants respectfully submit that RD '039

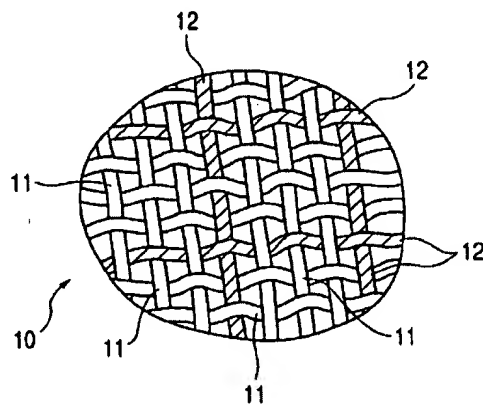
also does not teach or suggest a woven fabric for loud-speaker diaphragm using a woven fabric woven with a thread comprising fibers of plural kinds, characterized in that at least one of said fibers of the plural kinds is a fiber with poor dye-affinity and at least another one of said fibers of the plural kinds is a fiber colored with dyes or pigments.

The Official Action relies on Weber to allegedly teach "fabrics made from PBO fibers" (Id.). The Official Action asserts that it would have been obvious to one of ordinary skill in the art at the time of the present invention "to produce blended woven fabrics having PBO as described by Weber, Jr. et al. and using those fabrics in any of the end uses disclosed for PBO in RD 354039 A" (Id.). As motivation to combine RD '039 and Weber, the Official Action asserts that the combination would have been obvious "since RD 354039 A discloses that PBO fibers can be used in any number of end uses and that PBO fibers has equal or better properties than aramid fibers" (Id.). The Applicants respectfully disagree and traverse the above assertions in the Official Action.

The Appellants respectfully submit that the Official Action has not shown sufficient motivation to combine RD '039 and Weber, which is required to form a *prima facie* case of obviousness. RD '039 appears to teach the use of fibers of PBO in various applications, such as speaker cones, although the reference is completely silent as to details of such use. In this regard, Appellants note that Prior Art Figure 7 of the subject application and the associated description also appear to admit that PBO could be used in a speaker diaphragm. In the prior art, PBO fibers were woven into a fabric; however, using conventional methods, the PBO fibers created an unattractive lattice pattern 12.

Since RD '039 does not discuss the manner in which the PBO fibers are incorporated into the speaker cone, one is left to the state of

FIG. 7



the art at the time of the present invention. As discussed in the specification of the present application, conventional methods of using PBO in fabric for a speaker resulted in the lattice pattern 12 described and shown above.

As such, at best, RD '039 appears to disclose nothing further than the admitted Prior Art of Figure 7 of the subject application. Weber appears to teach that PBO is used for cut resistance in garments, such as gloves, and that nylon wrap fibers are used for making garments "comfortable." Specifically, Weber is concerned with the comfort of garments containing PBO. "Cut-resistant garments are frequently uncomfortable. They require large quantities of [cut-resistant] fiber that is expensive and reduces the comfort of the garment" (column 1, lines 28-29). "For instance, the polybenzazole-containing fiber or yarn may be woven with conventional clothing fibers ... to provide a woven garment that is more cut-resistant than garments woven entirely from the conventional fibers and more comfortable than garments woven entirely from the polybenzazole-containing fiber or yarn" (column 6, lines 38-45). "The optimum percentage [of PBO] will vary somewhat depending upon the polybenzazole polymer, the types of other fibers in the garment, and the relative needs for cut resistance and comfort" (column 7, lines 24-27). In other words, Weber teaches that conventional clothing fibers are used with PBO for comfort. Weber only peripherally mentions "Dyed Polyester" in Table 2 and is not concerned with the color or appearance of a fabric woven from PBO.

There is no logical connection between the speaker cone disclosure in RD '039 and Weber. The present invention is concerned with providing a uniform color for a speaker and preventing a lattice pattern as shown in Figure 7. The uniform color is achieved by wrapping fibers with poor dye affinity, such as PBO fibers, with dyed fibers. RD '039 and Weber do not discuss poor dye-affinity, any problems in dyeing PBO fibers, or a problem with the color of fabrics. At best, RD '039 appears to disclose that a speaker cone may be made with fibers containing PBO, and one might look to Weber to show that PBO should be wrapped with nylon for comfort. However, the Official Action has not shown that "comfort" would motivate one of ordinary skill in the art to wrap PBO fibers used in a speaker cone. In other words, when forming a loud-speaker

diaphragm, comfort would not have been a concern to one of ordinary skill in the art at the time of the present invention.

Also, it is not clear why one of ordinary skill in the art who was concerned with high tensile strength and modulus, high inflammability and heat resistance, and low smoke generation and moisture sensitivity would not have simply practiced RD '039 alone. Further, it is not clear why one of ordinary skill in the art who was concerned with comfort would not have simply practiced Weber alone. It is not clear why one would have been motivated to form the speaker cone of RD '039 from the twisted yarn of Weber. Therefore, the Official Action has not shown sufficient motivation in RD '039 or Weber to teach or suggest that the references could or should be combined.

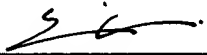
Therefore, the Applicant respectfully submits that the Official Action has not provided a proper suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify RD '039 and Weber or to combine reference teachings to achieve the claimed invention.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

For all of the above reasons, the present application is believed to be in condition for allowance and favorable reconsideration is respectfully requested. If the Examiner feels further discussions would expedite prosecution of this application, she is invited to contact the undersigned.

Respectfully submitted,



Eric J. Robinson
Registration No. 38,285

Robinson Intellectual Property Law Office
PMB 955
21010 Southbank Street
Potomac Falls, VA 20165
(571) 434-6789
(571) 434-9499 (facsimile)

VIII. APPENDICES

| | | |
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| A. | CLAIMS INVOLVED IN THE APPEAL | 16 |
| B. | REFERENCES | 18 |
| | 1. U.S. Patent No. 5,233,821 to Weber, Jr. et al. | |
| | 2. RD 354039 A to Anonymous | |
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APPENDIX A
PENDING CLAIMS

1-18. (Canceled)

19. (Previously Presented) A woven fabric for loud-speaker diaphragm using a woven fabric woven with a thread comprising fibers of plural kinds, characterized in that at least one of said fibers of the plural kinds is a fiber with poor dye-affinity such as PBO (poly(p-phenylene benzobisoxazole)) fiber and at least another one of said fibers of the plural kinds is a fiber colored with dyes or pigments.

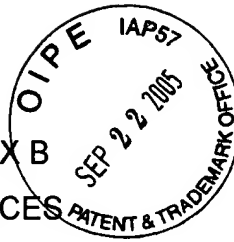
20. (Previously Presented) The woven fabric for loud-speaker diaphragm according to claim 19, characterized in that said colored fiber is made up of glass, polyester or polypropylene.

21. (Previously Presented) A diaphragm for loud-speaker, characterized in that said woven fabric for loud-speaker diaphragm according to claims 19 or 20 is used in at least a portion of the diaphragm.

22. (Previously Presented) A loud-speaker comprising a loud-speaker diaphragm, characterized in that the loud-speaker diaphragm is made up of said woven fabric for loud-speaker diaphragm according to claims 19 or 20.

23. (Previously Presented) A diaphragm for a loud-speaker comprising a woven fabric woven with a thread comprising fibers of plural kinds, characterized in that at least one of said fibers of the plural kinds is a fiber with poor dye-affinity such as PBO (poly(p-phenylene benzobisoxazole)) fiber and at least another one of said fibers of the plural kinds is a fiber colored with dyes or pigments.

24. (Previously Presented) A loud-speaker comprising a diaphragm, a portion of the diaphragm comprising a woven fabric woven with a thread comprising fibers of plural kinds, characterized in that at least one of said fibers of the plural kinds is a fiber with poor dye-affinity such as PBO (poly(p-phenylene benzobisoxazole)) fiber and at least another one of said fibers of the plural kinds is a fiber colored with dyes or pigments.

APPENDIX B
REFERENCESDocket No. 0670-0264
Serial No. 09/890,863

Copies attached.

APPENDIX C
EVIDENCE APPENDIX

Not applicable.

APPENDIX D
RELATED PROCEEDINGS APPENDIX

Not applicable.